

Binge Eating and Dietary Restraint: A Cross-Cultural Analysis

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Investigation of binge eating and dietary restraint has previously been limited to subjects within Western societies. We investigated these two phenomena in 218 Arab students in Egypt, using the Restraint Scale (Polivy, Herman, & Warsh, 1978) and the Binge Scale (Hawkins & Clement, 1980). The psychometric characteristics of the scales were investigated. Although exploratory factor analysis showed support for the Restraint Scale subscales in women, no coherent factor structure was found for men. Factor analysis also revealed differing factor structures for men and women in the Binge Scale. The internal validity of the scales for men was also poor, thus the application of these two instruments to Arab men is questionable. A significant correlation of Binge Scale and Restraint Scale scores was found for both genders indicating support for the hypothesized link between the phenomena in a non-Western culture. Further comparison of the Arab women's scores with those previously reported in Western studies showed a significantly lower level of restraint for the Arab women. We suggest that restraint theory is cross-culturally applicable for women, although cultural factors may mediate the level of restraint shown.

Binge eating, has been widely described in people with clinical eating disorders. However it is increasingly apparent that this "abnormal behavior" is also endemic to the general Western population (Healy, Conroy, & Walsh, 1985). Monthly binge-eating behavior is reported by around 21% of British women (Cooper, Waterman, & Fairburn, 1984).

Dietary restraint, (the regulation of food intake at below normal levels) is the apparent opposite of binge eating and has been the subject of much research

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(inter alia Herman & Mack, 1975; Wardle, 1986). Although initially studied in relation to obese subjects, it is a phenomena prominent in anorexia nervosa and bulimia. Dietary restraint is perhaps prevalent enough to be labeled "normal behavior" for Western women. Serious dieting has been reported by 40% of 18-year-old schoolgirls in Sweden (Nylander, 1971) and shown to be well established in British girls as young as 12 years old (Wardle & Beales, 1986). Psychometric tools to measure dietary restraint have been developed (Herman & Mack, 1975; Polivy, Herman, & Warsh, 1978; van Strien, Fritters, Bergers, & Defares, 1986) to investigate the phenomenon in a range of Western populations.

The relationship between binge eating and dietary restraint has recently come under scrutiny. Positive correlations between the two behaviors have been reported in surveys of student populations (Hawkins & Clements, 1980) and high levels of restraint are noted in women suffering from bulimia nervosa and the bulimic variant of anorexia nervosa. Wardle & Beinart (1981) suggest that binge eating is as much a consequence as a precipitant of dietary restraint with restraint predisposing the individual to a stretched state of self-control which is easily "snapped" by a small food intake or perhaps by dysphoric mood (Ruderman, 1985). A "disinhibition" model predicts that once restrained eaters have broken their "diet" they will be unable to maintain control and then compensatory overeating occurs. Prolonged or repeated restraint may lead to psychological as well as metabolic changes. Wardle (1987) further suggests that compensatory overeating following restraint can be viewed in terms of conflict between a biologically derived drive for food and a culturally derived drive for thinness.

Binge eating and dietary restraint have not been studied together in a non-Western culture. Binge eating is apparently less common in nonindustrialized countries. Certainly, anorexia nervosa and bulimia nervosa are rarely reported either outside Western societies, or in nonindigenous ethnic groups living within Western societies (Lacey & Dolan, 1988; Dolan, 1990). The culturally different standards of attractiveness for female body shape and attitudes towards dieting have been cited as major mediating factors in the prevalence of eating disorders (Nasser, 1986; 1988). Several authors have discussed eating disorders in terms of a culture-bound syndrome (i.e., a collection of symptoms of disease restricted to a limited culture primarily by reason of psychosocial features, Prince, 1983; DiNicola, 1988). Clearly such a sociocultural etiology could be mediated through increased restraint.

We sought to test for evidence of the coincidence of binge eating and dietary restraint in a non-Western culture and, as a necessary preliminary to this analysis, to determine whether the psychometric structure of measures of restraint and binge eating as established in Western samples could be replicated in female and male Egyptian University students.

METHODS

Subjects were 160 Arab women and 58 Arab men recruited from Introductory Psychology, Sociology, and Anthropology classes at the American University in Cairo, Egypt. This is an English-speaking University and, although the

majority of students do not have English as a mother tongue, all students are proficient in spoken and written English. The mean age of the women was 19.5 ± 1.46 years and for men was 20.0 ± 2.5 years. Of the students, 37% were in the junior year, 32% were sophomores, and 31% were seniors. The majority (80%) of the subjects were Moslem, and the rest were Christian. Twelve other students who had European or American citizenship were excluded from the analysis. There were no refusals, although some questionnaires were incomplete.

Binge eating was measured using the 9-item Binge Scale Questionnaire (Hawkins & Clement, 1980). Before presentation of the questionnaire, "a binge" was described to each subject as "eating a large amount of food in a short period of time, not a proper meal." Dietary restraint was measured with the 10-item restraint scale (RS) (Polivy et al., 1978). This questionnaire has been divided into two subscales, one consisting of six questions relating to concern with dieting (CD), and the other being four questions related to weight fluctuation (WF). Questions worded in pounds in the original questionnaire were transformed to their approximate kilogram equivalent.

The questionnaires employed have not been used previously in a non-Western population, thus a psychometric investigation of the questionnaires was conducted to assess the applicability and robustness of the scales across cultures. Psychometric evaluation included an investigation of internal validity using Cronbach's alpha (Cronbach, 1951). Exploratory factor analysis was performed on both scales for the subjects with no missing data. Factors were rotated to orthogonal structure according to Varimax criterion, a three-factor solution was specified.

RESULTS

Internal Validity Analysis

The internal validity of each scale was assessed using coefficient alpha. The restraint scale produced a total alpha of 0.69 for the female sample and 0.61 for the male group. However, the alpha values for the two subscales showed less

Table 1. Item-analysis of the restraint questionnaire subscales.

Item and Number	Correlations	
	Women	Men
1. How often are you dieting?	0.62	0.32
5. Would a weight fluctuation of 5 lb affect the way you live?	0.43	0.09
6. Do you eat sensibly in front of others and splurge alone?	0.30	0.21
7. Do you give too much time and thought to food?	0.42	0.40
8. Do you have feelings of guilt after overeating?	0.59	0.48
9. How conscious are you of what you are eating?	0.36	0.30
Total CD subscale alpha	0.72	0.54
2. What is the maximum amount of weight you have lost in a month?	-.08	0.08
3. What is your maximum weight gain within a week?	0.42	0.46
4. In a typical week how much does your weight fluctuate?	0.39	0.45
10. How many pounds over your desired weight were you at maximum?	0.34	0.36
Total WF subscale alpha	0.47	0.50

Table 2. Item-analysis of the binge scale.

Item	Correlations	
	Women	Men
1. How often do you binge eat?	0.20	0.20
2. What is the average length of a binge episode?	0.10	-0.2
3. Termination of binge episode	0.30	0.04
4. Do you ever vomit after a binge?	0.17	-0.8
5. Speed of eating during a binge	0.17	-0.2
6. How much are you concerned about your binge eating?	0.63	0.43
7. Feel in control during a binge	0.41	0.09
8. Feel upset after a binge.	0.62	0.72
9. Feel depressed after a binge	0.72	0.70
Total scale alpha	0.70	0.46

internal validity. The binge scale had a total alpha coefficient of 0.70 for the women indicating acceptable internal validity, whereas the male group had a lower alpha of 0.46. The item total correlations for each scale and subscale are shown in Tables 1 and 2.

Factor Analysis

Exploratory factor analysis of the binge scale revealed a first factor that loaded on items 6, 7, 8, and 9 for both the male and female group. This factor accounted for 31.5% and 26% of the variance in the male and female groups, respectively, and corresponds to the first factor described by Hawkins & Clement (1980) as a "guilt and concern" measure. For the female group, a second factor was identified accounting for 12% of variance, which loaded on items 1, 3, 4, and 5. This factor corresponds to Hawkins and Clements' second factor measuring "behavior and satiety feeling." However, for men this smaller factor was less clear and was not consistent with the findings in the women's group (Table 3).

Table 3. Rotated factor loadings for the binge scale factors.

Item	Women		Men	
	F.I	F.II	F.I	F.II
	Guilt and Concern	Behavior and Satiety	Guilt and Concern	Behavior and Satiety
1	*	.32	*	-.34
2	*	*	*	-.63
3	*	.57	*	*
4	*	.33	*	*
5	*	.81	*	.64
6	.84	*	.66	*
7	.36	*	.30	.62
8	.90	*	.92	*
9	.90	*	*	*

*Item loading <0.3.

Table 4. Rotated factor loadings for the restraint factors

Item	Women		Men	
	F.I (CD)	F.II (WF)	F.I (CD)	F.II (WF)
1	.73	*	.67	*
5	.72	*	*	*
6	*	.35	*	.70
7	.46	*	.77	*
8	.80	*	.41	.57
9	.65	*	*	.73
2	*	*	*	-.30
3	*	.76	.77	*
4	*	.70	.81	*
10	*	.70	.47	*

*Item loading <0.3.

FI = Factor 1

FII = Factor 2.

Factor analysis of the restraint scale showed some support for the subscale structure in women but not for men. For the women, a first factor accounted for 28% of variance loading on items 1, 5, 7, 8, and 9 (i.e., CD items), the second factor accounted for 16% of variance loaded on three of the four WF items (3, 4, 10) and on item 8. Item 2 "maximum amount of weight lost" did not load on either of these factors. For men, the factor analysis of the restraint scale showed no support for the subscale structure following rotation. Item loadings for the main factors for each scale by gender are shown in Table 4.

Mean Scale Scores

Mean scores were calculated for each scale (Table 5). The numbers of subjects reporting any binge eating episodes ever were high, 82% of women, and 76% of men, there was no significant sex difference. Women scored significantly higher than men did on the Binge Scale ($p = 0.05$) however, there was no significant difference between the mean scores of women and men on the Restraint Scale or the WF and CD subscales. Failures of completion for the restraint questionnaire were notable, only 78% of women and 62% of men completed the WF scale compared with 98% and 96.6%, respectively for the CD scale.

The mean scores on the restraint scale and its subscales were then compared with those reported by Wardle (1986) in a sample of British female students. For women, the Egyptian group scored significantly less than did Wardle's sample on the total RS score and the WF subscale. For men, there was no difference on the total score but the Egyptian group scored significantly higher than did the British group on the CD scale and significantly lower on the WF scale. Egyptian women's Binge Scale scores were not significantly different from those originally reported by Hawkins & Clement (1980) for American students.

Table 5. Mean restraint scale and binge scale scores.

	N	Mean	SD
Arab women			
Binge scale	160	6.8	4.9 ^a
Restraint scale	122	10.1	4.1
Concern with dieting	157	8.5	3.6
Weight fluctuation	125	1.44	1.4
Arab men			
Binge scale	58	4.8	3.7 ^a
Restraint scale	35	8.3	3.8
Concern with dieting	56	6.1	3.6
Weight fluctuation	36	1.7	1.9
		Previous Data for Women	
Hawkins & Clement (1980)			
Binge scale	160	5.63	4.37
Restraint scale	67	13.5	5.4 ^b
Wardle (1986)			
Concern with dieting	99	7.8	3.7
Weight fluctuation	67	4.9	2.8 ^b

^aSignificant difference between genders, $p < 0.05$.

^bSignificant difference from Arab women, $p > 0.05$.

Intercorrelations of Scale Scores

The intercorrelation coefficients for the scales are shown in Table 6. There was a significant positive correlation between the total Restraint Scale and Binge Scale scores for each gender. Each of the restraint subscales also correlated significantly with the Binge Scale scores, however, the correlation coefficient for the WF subscale was small.

Table 6. Correlation coefficients of restraint and binge scales.

	Binge Scale	Weight Fluct.	Diet Concern	Restraint Scale
Binge Scale		0.25 (.001)	0.67 (.001)	0.67 (.001)
Weight Fluctuation	0.32 (.05)		0.18 (.001)	
Diet Concern	0.52 (.001)	0.36 (.02)		
Restraint Scale	0.57 (.001)			

DISCUSSION

The study has shown that episodes of binge eating are extremely common amongst Egyptian students at an English-speaking University. In addition, the results showed a significant correlation of binge eating and dietary restraint in both female and male students. Initially, some methodological caveats must be addressed.

First, the study population was not representative of the general Egyptian population, in terms of educational or social status, and results must not be generalized. The instruments used in this study have not been applied outside Western cultures. When applying scales cross-culturally, it is necessary to investigate the psychometric properties to ensure that cross-cultural application is valid. Similarly, the Restraint Scale was initially developed for American female samples, and most subsequent psychometric investigations have been limited to women, thus it has not been validated in male groups.

The item analysis of the two questionnaires showed good scale-item total correlations for the Binge Scale (0.70) and the concern with dieting (CD) subscale of the Restraint Scale (0.72) in women, indicating good internal consistency (validity). However, for all the scales in men and the WF subscale in women, the item-total correlations were poor (alphas ≈ 0.5). Previous research (Ruderman, 1983) has indicated that the CD subscale is the more robust of the Restraint Scale subscales and certainly that was supported in the current psychometric findings. Wardle (1986) has noted problems with completion of the Restraint Scale, particularly the weight fluctuation (WF) subscale, which requires factual information concerning weight change, and has suggested that the validity of the scale is compromised by this noncompletion. For our study, we found that 22% of women and 32% of men did not complete all questions on the WF subscale. Although not ideal, these rates are slightly better than those reported by Wardle (1986) who found that one-third of women and two-thirds of men did not complete the questionnaire.

Factor analysis of the Restraint Scale for Egyptian women indicated the existence of two main factors that corresponded to the CD and WF subscales. This factor structure has been confirmed by Blanchard & Frost (1983) and Ruderman (1983) in American female students.

Ruderman (1983), however, was unable to confirm existence of factors corresponding to the CD and WF subscales in a group of obese women. For Egyptian men no coherent factor structure was revealed. So it may be that the Restraint Scale is measuring different aspects in the female and male Egyptian groups. The evidence from the psychometric investigation now suggests that, although a similar factor structure exists for American and Egyptian women, interpretation of any results from the restraint scale should be cautious in groups other than normal-weight women.

Factor analysis of the Binge Scale revealed two main factors in the female group that corresponded to those described by Hawkins and Clement (1980) as "Guilt and concern with eating" and "Behavior and satiety." However, for the male group, only the first of these factors was identifiable. Although we must acknowledge that the small size of the male group will effect these findings, combined with the poor internal validity it suggests that the applica-

bility of both the restraint scale and the binge scale to Egyptian men is questionable.

The present study found no difference between women and men on mean scores of the Restraint Scale and subscales. In contrast, Wardle (1986) reported that British women scored significantly higher than did British men on these measures. Considering the differing factor structures and the poor internal consistency found for men it may be that the lack of score differences between Egyptian men and women is a function of differences in psychometric qualities of the scales, rather than a true lack of difference in restraint and binge-eating behavior. Further interpretation of the mens results for this study would be on dubious statistical grounds. For Egyptian women, the Binge Scale and Restraint Scale met reasonable psychometric standards and thus only the womens' results will be discussed further.

Comparison of Egyptian women with Wardle's (1986) sample showed that The Egyptians scored significantly lower on the overall Restraint Scale. Addressing the two factors of restraint separately, whereas the WF subscale was significantly lower for the Egyptian than the British group, there was no difference between the groups in the CD subscale score.

The Binge Scale mean score did not differ significantly from that reported by Hawkins & Clement (1980) in their original development sample. Of the Egyptian women, 18% reported never having binge-eaten, similarly 21% of the American sample did not binge eat. Thus, binge eating is a common phenomena in this group of Egyptian students. In an earlier study, Nasser (1986) investigated the incidence of eating disorders in 60 women attending Cairo University (an Arabic medium University with less Western influence than the American University in Cairo). After interviewing high Eating Attitudes Test (EAT) -40 scorers Nasser reported that binge-eating behavior did not occur in this group, the most usual symptoms being dieting and fasting. Although compulsive eating has been described in obese Arab women (Toubia, 1988), our study has shown that Egyptian women also may experience binge eating and (as measured by the Binge Scale) to a similar degree as Western women. Perhaps the degree of Westernization in our sample may account for this different finding. Certainly, exposure to Western culture has been implicated as contributory to the development of bulimia, as supported by Nasser's (1986) finding of clinical bulimia nervosa in 12% of Arab female students studying in England.

Restraint theory suggests that Restraint Scale scores will predict compensatory overeating (i.e., binge-eating behavior). Although all previous work has been in North America and Europe, the correlation of the two scales confirms the association of these phenomena in an Egyptian sample. The size of the correlation (0.57) is similar to that found by Hawkins & Clement (1980) (0.61). Thus it would seem that Restraint Theory may be cross-culturally applicable for women. *Dietary Restraint* is described as the *intention* to restrict food intake (Wardle, 1987). Although we can show the existence of restraint in our sample, what may be of more interest is the etiology of this *intention* a culture that traditionally does not place so much influence upon weight and shape. We can only hypothesize that influences from both the educational setting and from students having lived in Western countries may contribute to the concern with dieting and weight shown by this group. Our knowledge would benefit from

conducting the study in a more traditional Egyptian group who are less exposed to Western culture.

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